

REVIEW OF THE NEW WORLD SPECIES OF THE GENUS *NEOTTIGLOSSA* KIRBY (HETEROPTERA: PENTATOMIDAE)

D. A. RIDER

Department of Entomology, Louisiana Agricultural Experiment Station,
Louisiana State University Agricultural Center,
Baton Rouge, Louisiana 70803

Abstract.—The five North American species of the genus *Neottiglossa* are reviewed. Diagnoses are provided for the genus *Neottiglossa*, for the two subgenera, and for the North American species. *Neottiglossa trilineata* (Kirby) and *N. undata* (Say) belong in the nominate subgenus, while *N. cavifrons* Stål, *N. sulcifrons* Stål, and *N. tumidifrons* Downes belong in the subgenus *Texas* Kirkaldy. *Neottiglossa coronaciliata* Ruckes, 1957 is placed as a junior synonym of *Neottiglossa cavifrons* Stål, 1872; and *N. californica* Bliven, 1958 is placed as a junior synonym of *N. undata* (Say, 1832). A key is provided for the identification of species.

The genus *Neottiglossa* Kirby belongs in the nominate tribe and subfamily of the Pentatomidae, and lacks a spine or tubercle at the base of abdominal segment 3 (2nd visible). Related Western Hemisphere genera occurring north of South America were keyed by Rolston and McDonald (1984). The North American species of *Neottiglossa* form two distinct species groups: *N. trilineata* (Kirby) and *N. undata* (Say) belong in the nominate subgenus, while *N. cavifrons* Stål, *N. sulcifrons* Stål, and *N. tumidifrons* Downes belong in the subgenus *Texas* Kirkaldy.

Neottiglossa species are quite similar in appearance, which has resulted in confusion concerning the identity of several species. All New World species are herein reviewed, and a key is provided for the identification of subgenera and species.

Neottiglossa Kirby, 1837

Pentatoma (*Neottiglossa*) Kirby, 1837:276.

Aelioides Dohrn, 1859:101; Mulsant and Rey, 1866:142.

Platysolen Fieber, 1860:82.

Neottiglossa: Uhler, 1871:96-97, Stål, 1872a:36; Stål, 1872b:18; Lethierry and Severin, 1893:137; Summers, 1898:42; Jakovlev, 1903:325-327; Kirkaldy, 1904:280; Van Duzee, 1904:49-50; Kirkaldy, 1909:79; Zimmer, 1912:222, 230; Parshley, 1915:172; Van Duzee, 1917:47; Hart, 1919:179, 186-187; Stoner, 1920:62, 92; Parshley, 1923:758, 765; Blatchley, 1926:122, 148; Torre-Bueno, 1939:209, 226-227; Froeschner, 1941:128, 130; Esselbaugh, 1946:690; Hoffman, 1971:29, 42; Furth, 1974:26, 37; McPherson, 1982:47, 71; Froeschner, 1988:586.

Type species. *Pentatoma* (*Neottiglossa*) *trilineata* Kirby, 1837, by monotypy.

Diagnosis. Small, less than 7 mm in length; elongate oval, strongly convex; usually fuscous to black with pale markings. Abdominal segment 3 (2nd visible) lacking basal spine or tubercle. Jugal distinctly longer than tylus and contiguous in front of it. Propleura produced cephalad, antennifers exposed in lateral view. Ostiolar rugae small, each usually extending about three-fourths distance to lateral margin of meta-

pleuron as small polished ridge. Scutellum broadly rounded apically, width at distal end of frena 0.5 or more width at base. Scutellum nearly as long as or longer than coria.

Comments. *Neottiglossa* is closely related to the genus *Aelia* Fabricius, but can be separated from that genus by the smaller size and by differences in the structure of the propleura. Species of the genus *Aelia* are usually more than 8 mm in length and have the propleura covering the antennifers. Species of *Neottiglossa* are usually less than 7 mm in length, and the antennifers are exposed.

Five species of *Neottiglossa* occur in the New World. These are placed into two subgenera. *Neottiglossa cavifrons*, *N. sulcifrons*, and *N. tumidifrons* belong in the subgenus *Texas*, while the nominate subgenus contains *N. trilineata* and *N. undata*.

KEY TO THE NORTH AMERICAN SUBGENERA AND SPECIES OF
Neottiglossa KIRBY

- 1. Coxae pale yellow; evaporative surfaces pale yellow to brown-grey with contrasting black punctures subgenus *Neottiglossa* Kirby 2
- Coxae fuscous to black; evaporative surfaces black with concolorous punctures ..
..... subgenus *Texas* Kirkaldy 3
- 2(1). Dorsal surface of head and propleura mostly black with concolorous punctures ..
..... *trilineata* (Kirby)
- Dorsal surface of head and propleura with large areas of pale yellow to brown with black punctures *undata* (Say)
- 3(1). Apex of head broadly rounded, arcuate (Fig. 7); dorsal surface of head distinctly concave, thickly clothed with short inward-curving hairs *cavifrons* Stål
- Apex of head more tapering, narrowly rounded (Figs. 10, 14); dorsal surface of head not distinctly concave, or if somewhat concave then lacking short hairs 4
- 4(3). Boundary between dark surface of abdominal venter and pale lateral callus relatively straight, sharp (Fig. 13); trochanters dark fuscous; scutellum lacking medial pale line (Fig. 11) *sulfifrons* Stål
- Boundary between dark surface of abdominal venter and pale lateral callus diffuse, not well defined (Fig. 17); trochanters pale; scutellum usually with medial pale line (Fig. 15) *tumidifrons* Downes

Subgenus *Neottiglossa* Kirby, 1837

Pentatoma (*Neottiglossa*) Kirby, 1837:276.

Aelioides Dohrn, 1859:101; Mulsant and Rey, 1866:142.

Platysolen Fieber, 1860:82.

Neottiglossa: Stål, 1872b:18; Kirkaldy, 1904:280; Kirkaldy, 1909:79; Van Duzee, 1917:47; Stoner, 1920:92; Froeschner, 1988:586.

Type species. *Pentatoma* (*Neottiglossa*) *trilineata* Kirby, 1837, by monotypy.

Diagnosis. Coxae, trochanters, and base of each femur pale yellow, some fuscous markings medially on each femur. Evaporative surfaces fairly extensive, pale yellow to brown-grey with black punctures. Each ostiolar ruga auriculate with anterior portion produced laterad into small obscure polished ridge. Juga only slightly elevated above surface of head; dorsal surface of head relatively flat, not concave. Segments 4-5 of antennae fuscous, distinctly darker than segments 1-3. Scutellum subequal in length or slightly shorter than coria.

Comments. Previous workers have usually defined this subgenus by the slightly tumescent juga and by the auriculate nature of the ostiolar rugae. The jugal character can be hard to diagnose, and in most specimens each ostiolar ruga is produced laterad as a small, obscure, polished ridge. The two included species are, however, more closely related to each other than to the three remaining species. Specimens of this subgenus tend to be slightly larger and more broadly oval than specimens of the subgenus *Texas*. They can be easily recognized by the pale coxae and pale evaporative surfaces.

Neottiglossa trilineata (Kirby, 1837)

Figs. 1–3

Pentatoma (*Neottiglossa*) *trilineata* Kirby, 1837:276, pl. 6, fig. 6.

Aelia trilineata: Dallas, 1851:224.

Neottiglossa (*Neottiglossa*) *undata* (of authors, not Say): Stål, 1872b:18 (part).

Neottiglossa trilineata: Uhler, 1877:401; Uhler, 1886:5; Hussey, 1922:85–88, figs. 1a, 1c; Blatchley, 1926:148, 149–150; McPherson, 1970:52; McPherson, 1980:6; McPherson, 1982:72.

Neottiglossa undata (of authors, not Say): Lethierry and Severin, 1893:138 (part).

Neottiglossa (*Neottiglossa*) *undata* var. *trilineata*: Kirkaldy, 1909:80; Zimmer, 1912:230.

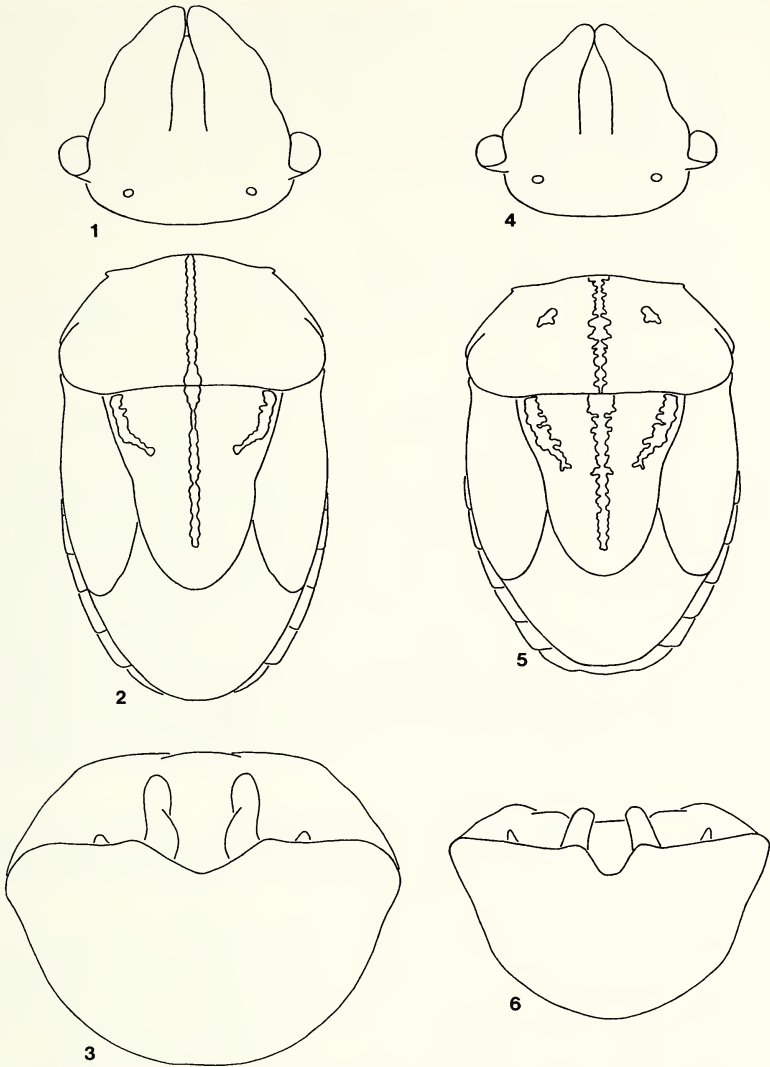
Neottiglossa (*Neottiglossa*) *trilineata*: Van Duzee, 1916:6; Van Duzee, 1917:48; Torre-Bueno, 1939:226; Froeschner, 1988:586.

Diagnosis. Lateral margins of head tapering to narrowly rounded apex (Fig. 1); dorsal surface not concave, rather flat medially, lacking hairs, mostly fuscous or black with concolorous punctures, except sometimes with partial medial pale stripe basally. Scutellum with pale medial stripe from base to apical infuscated area (Fig. 2). Ventral surface of head black except bucculae pale; propleura black except area around coxal cavity, obscure area along posterior margin, and narrow lateral margin pale. Mesopleura and metapleura black except area around coxal cavities and evaporative area pale. Boundary between dark abdominal surface and pale lateral margin abrupt, distinct, with only a few fuscous punctures in pale area. Femora with numerous fuscous spots medially; coxae, trochanters, and base of each femur pale. Medial excavation in posterior margin of pygophore relatively broad, shallow (Fig. 3).

Types. Kirby (1837) described *N. trilineata* from a single specimen from Saskatchewan. The deposition of the type specimen is unknown.

Specimens examined. 22 specimens collected from 18 May to 15 August. CANADA: ALBERTA: Bilby; Whitford Lake. MANITOBA: Cedar Lake; Winnipeg. NORTHWEST TERRITORIES: Great Bear Lake. ONTARIO: Belmont. UNITED STATES: CALIFORNIA: Grass Lake. COLORADO: *Boulder*: Longs Peak Inn. *Larimer*: Fort Collins, Rist Cyn. IDAHO: *Latah*: 6 mi N Bovill. OREGON: *Grant*: Seneca. WYOMING. *Sheridan*: 42 mi W Sheridan, Prune Crk. *Sublette*: Green R. Lake. *Teton*: Yellowstone Natl. Park, Yellowstone Lake.

Comments. This species is most closely related to *N. undata* from which it can be separated by the darker coloration of the propleura and the dorsal surface of the head. The relatively broad medial excavation in the posterior margin of the pygophore is also diagnostic.



Figs. 1–6. Figs. 1–3. *N. trilineata*. 1. Head. 2. Habitus. 3. Pygophore, caudal view. Figs. 4–6. *N. undata*. 4. Head. 5. Habitus. 6. Pygophore, caudal view.

Neottiglossa undata (Say, 1832)

Figs. 4–6

Pentatoma undata Say, 1832:8; Say, 1859:319–320.

Neottiglossa undata: Uhler, 1871:96–97; Uhler, 1872a:395; Uhler, 1872b:471; Uhler, 1876:284; Uhler, 1877:401; Uhler, 1878:376; Provancher, 1885:39; Uhler, 1886:5; Van Duzee, 1889:2; Osborn, 1892:121; Lethierry and Severin, 1893:138 (part);

Van Duzee, 1894:170; Wirtner, 1904:187; Van Duzee, 1904:49, 50; Van Duzee, 1905:548; Smith, 1910:133; Olsen, 1912:53; Zimmer, 1912:230; Van Duzee, 1912:318; Torre-Bueno, 1913:58; Parshley, 1914:148; Parshley, 1915:175; Stoner, 1915a:355; Stoner, 1915b:353–354; Parshley, 1917:22; Stoner, 1917:45; Torre-Bueno, 1918:25; Hart, 1919:186, 187; Hussey, 1922:85–88, figs. 1b, 1d; Parshley, 1923:765; Stoner, 1925:57; Blatchley, 1926:148–149; Stoner, 1926:29; Brimley, 1938:62; Furth, 1974:37–38; McPherson, 1970:52; McPherson, 1979:93; McPherson, 1980:6; McPherson, 1982:72.

Aelia americana (of authors, not Dallas): Provancher, 1885:38.

Mormidea undata: MacGillivray & Houghton, 1903:262–265.

Neottiglossa (*Neottiglossa*) *undata*: Stål, 1872b:18 (part); Kirkaldy, 1909:80; Van Duzee, 1916:6; Van Duzee, 1917:48; Stoner, 1920:93–94; Torre-Bueno, 1939:226; Froeschner, 1988:586.

Neottiglossa californica Bliven, 1958:12–13. NEW SYNONYMY.

Neottiglossa (*Texas*) *californica*: Froeschner, 1988:587. NEW SYNONYMY.

Diagnosis. Lateral margins of head tapering to narrowly rounded apex (Fig. 4); dorsal surface not concave, relatively flat medially, devoid of hairs; mostly pale yellow to brown with black punctures. Scutellum mostly pale except usually with small infuscated area distally and sometimes obscure infuscated areas basally; with distinct medial pale impunctate line (Fig. 5). Ventral surface of head fuscous except bucculae and surrounding area pale; thoracic pleura mostly pale with black punctures; evaporative area rather extensive, pale. Boundary between dark abdominal surface and pale lateral margin usually indistinct, diffuse, sometimes a pale spot surrounding each spiracle and obscure pale areas in band just mediad of spiracles. Femora with a few fuscous spots medially, apical tarsal segment sometimes brown; coxae, trochanters, and base of each femur pale. Medial excavation in posterior margin of pygophore relatively narrow, deep (Fig. 6).

Types. Say (1832) described this species from an unknown number of specimens from the Northwest Territory. The types are apparently no longer in existence, but because the identity of this species has never been in question, a neotype is not designated.

Bliven (1958) described *N. californica* from 12 specimens from Humboldt County, California. The holotype and all 11 paratypes, which are housed in the California Academy of Sciences, San Francisco, were examined. There is no consistent difference between *N. californica* and *N. undata*.

Specimens examined. 167 specimens collected from 7 April to 12 October. CANADA: ALBERTA: Bilby. BRITISH COLUMBIA: Summerland; Thornbull Mtn, Terrace; Victoria; Wellington. MANITOBA: Cedar Lake. NEW BRUNSWICK: Moncton. NEWFOUNDLAND: Buchans Road; Kings Point Bog. NOVA SCOTIA: Halifax. ONTARIO: Crystal Bay; Dundas; 15 mi NW Ignace; Oakwood nr. Lindsay; Obatanga Provincial Park; Ottawa, Nepean; Ridgeway; Sault Ste. Marie; Swansea. QUEBEC: Luskville Falls. UNITED STATES: CALIFORNIA: *Humboldt*: Eureka; Fieldbrook; Shively. *Mendocino*: 15 mi E Fort Bragg. *Shasta*: 25 mi SE McCloud; Hwy 299, Hat Crk. COLORADO: *Boulder*: Gregory Cyn. *Douglas*: Prairie Park. CONNECTICUT: Luternk. *New Haven*: 2 mi E Seymour Marsh. IDAHO: *Blaine*: Bellevue. *Bonner*: Walsh Lake, Samuels. *Elmore*: Dixie. *Idaho*: 10.2 mi WSW Lolo Pass, Powell Pasture. *Latah*: Moscow. *Lemhi*: 5 mi S Salmon. INDIANA: *Howard*. *Noble*: Sylvan Lake.

IOWA: *Black Hawk*: Cedar Falls. *Boone*: Pilot Mound. *Cass*: Atlantic. *Iowa*: Amana. *Story*: Ames. *Webster*: Fort Dodge. MAINE: *Franklin*: Farmington. MASSACHUSETTS: *Essex*: Marblehead. *Middlesex*: Tyngsboro. *Worcester*: Worcester. MICHIGAN: *Clinton*: Rose Lake Wildlife Expt Stn. *Gogebic*. *Kalkaska*. *Oakland*. MINNESOTA: *Clearwater*: Itasca Park. *Itasca*: Deer Lake. *Polk*: Crookston. MONTANA: *Gallatin*: nr. Bozeman; Gallatin R. *Lincoln*: Libby Crk, 5 mi S Libby. NEVADA: *Washoe*: Verdi. NEW HAMPSHIRE: *Coos*: Mt. Washington. *Grafton*: Franconia. NEW YORK: Pine Island; Yaphank. *Columbia*: Chatham. *Erie*: Lancaster. *Monroe*: Rochester. *Orange*: Greenwood Lk. *Suffolk*: Mastic Beach, Long Island. *Tompkins*: Ithaca. OHIO: *Ashtabula*: Crooked Crk Farm nr. Hartsgrove. OREGON: Brownsmead. *Baker*: Spring Crk. *Benton*: Corvallis. *Columbia*: Goble; Scappoose. *Deschutes*: Redmond. *Douglas*: 18 mi W Diamond; 20 mi E Reedsport, Spencer Crk; 7 mi NW Roseburg. *Hood River*: Parkdale. *Jackson*: Buckhorn Mineral Sprg; 22 mi N Prospect. *Klamath*: 7 mi NW Bly, Meryl Crk; Crater Lake Natl Park; Crescent Lake; 12 mi SW Keno; Klamath Falls; Mares Egg Sprg; Sun Crk; Wood R. Sprg. *Lake*: Hart Lake. *Multnomah*: Gresham. *Polk*: Monmouth. PENNSYLVANIA: *Wayne*: Hawley; Honesdale. SOUTH DAKOTA: *Lawrence*: Savoy, Spearfish Cyn. UTAH: *Cache*: Logan; Providence. *Emery*: Green. VERMONT: *Windsor*: Woodstock. WASHINGTON: *Wawai*. *Jefferson*: Olympic Natl. Park. *Okanagon*: Okanagon nr. Buzzard Lake. WISCONSIN: *Dane*: Madison. American Falls. WYOMING: *Albany*: Snowy Range Mtns. *Sheridan*: Banner. *Teton*: Yellowstone Natl. Park. *Whitman*: 8 mi SW Pullman, Lyle Grove Biol. Area.

Comments. This species is most closely related to *N. trilineata* from which it can be distinguished by the more extensive pale areas on the propleura and the dorsal surface of the head and by the relatively narrow medial excavation in the posterior margin of the pygophore.

Subgenus *Texas* Kirkaldy, 1904

Neottiglossa (Melanostoma) Stål, 1872b:18 (preoccupied).

Neottiglossa (Texas) Kirkaldy, 1904:280 (replacement name); Kirkaldy, 1909:79, 80; Van Duzee, 1917:48; Stoner, 1920:92; Froeschner, 1988:586.

Type species. *Neottiglossa sulcifrons* Stål, 1872, by subsequent designation (Kirkaldy, 1909:XXX).

Diagnosis. Coxae fuscous, trochanters and base of each femur often fuscous. Evaporative surfaces reduced, black with concolorous punctures. Jugal usually distinctly tumescent, in lateral view elevated above surface of head; dorsal surface of head sometimes concave. Each ostiolar ruga not auriculate, but produced laterad into relatively well-defined polished ridge. Segments 4–5 of antennae only slightly darker than segments 1–3. Scutellum longer than coria.

Comments. The three species in this subgenus are easily recognized by the fuscous coxae and the black evaporative surfaces.

Neottiglossa cavifrons Stål, 1872

Figs. 7–9

Neottiglossa (Melanostoma) cavifrons Stål, 1872b:18.

Neottiglossa cavifrons: Uhler, 1886:5; Lethierry and Severin, 1893:137; Scott and

Fiske, 1902:31; Hart, 1919:186, 187; Blatchley, 1926:148, 151; Downes, 1928:91, fig. 1; Brimley, 1938:62; Froeschner, 1941:130, 139; Esselbaugh, 1946:678, 680; Esselbaugh, 1948:28; Hoffman, 1971:42; Oetting and Yonke, 1971:457-458; Furth, 1974:37, 38; McPherson and Mohlenbrock, 1976:153; McPherson, 1978:161; McPherson, 1979:93; McPherson, 1980:6; McPherson, 1982:71-72.

Neottiglossa (Texas) cavifrons: Kirkaldy, 1904:280; Kirkaldy, 1909:80 (part); Van Duzee, 1917:48 (part); Torre-Bueno, 1939:227 (part); Froeschner, 1988:587.

Neottiglossa coronaciliata Ruckes, 1957:41. NEW SYNONYMY.

Neottiglossa (Texas) coronaciliata: Froeschner, 1988:587. NEW SYNONYMY.

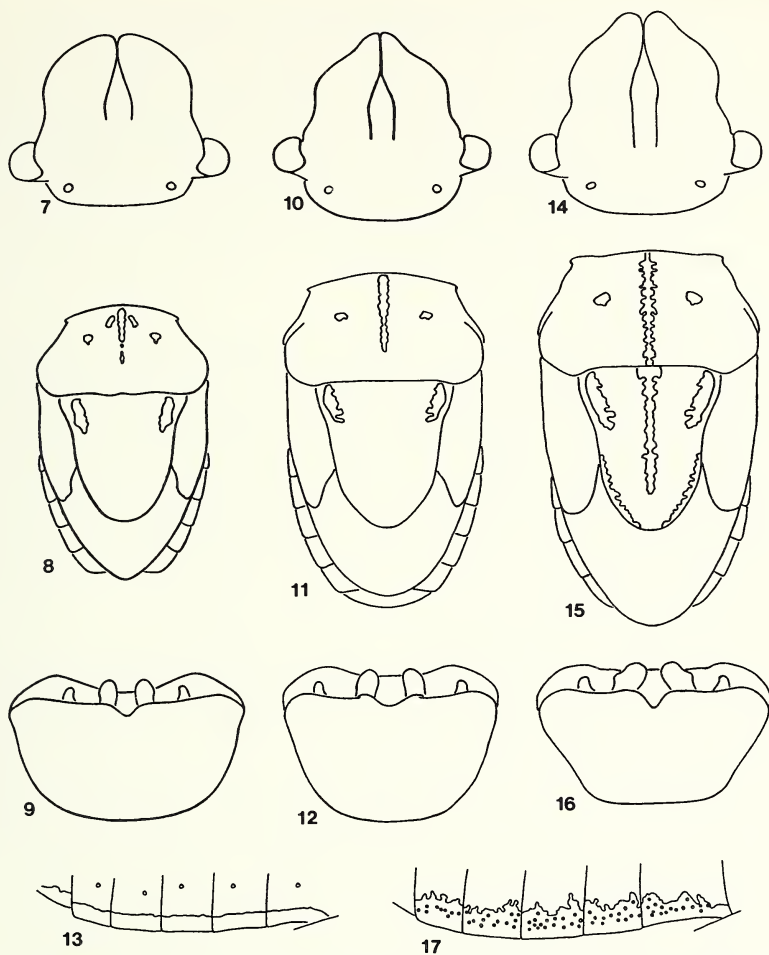
Diagnosis. Head broadly rounded apically, arcuate (Fig. 7); dorsal surface distinctly concave, clothed with numerous, silver, inward-curving hairs; juga completely black. Scutellum fuscous or black except two subbasal calloused spots and narrow lateral margins near apex pale, lacking pale medial line (Fig. 8). Ventral surface of head and thoracic pleura black except narrow lateral margin of propleura pale; ostiolar rugae and evaporative surfaces black with black punctures. Boundary between dark abdominal surface and pale lateral margin abrupt, distinct. Legs pale except coxae, trochanters, and base of each femur fuscous, sometimes a few small fuscous spots medially on each femur. Posterior margin of pygophore as in figure 9.

Types. Stål (1872b) described *N. cavifrons* from at least one male and one female specimen from Texas. The types were not examined but the description is sufficient to identify this distinctive species. In the original description Stål states "Caput parte anteculari concaviuscula, pilosa, ante medium utrimque rotundato-angustata." There is only one Western Hemisphere species of *Neottiglossa* with the apex of the head rounded and the dorsal surface distinctly concave and pilose as in the above description. The types are housed in the Swedish Museum of Natural History, Stockholm.

Ruckes (1957) described *N. coronaciliata* from two female specimens from Texas and Louisiana. Both specimens were examined and differ in no significant way from *N. cavifrons*. Both the holotype and paratype are conserved in the American Museum of Natural History, New York.

Specimens examined. 244 specimens collected from 4 April to 29 June. UNITED STATES: ALABAMA: *Butler*: I-65, 4.5 mi S Hwy 10. *Lee*: Auburn. *Macon*: I-85, 5.1 mi E Shorter. ARKANSAS: *Izard*: Mt. View. *Union*: Smackover. GEORGIA: *Jefferson*: Louisville. KENTUCKY: *Christian*. LOUISIANA: *Caddo*: 2 mi S Shreveport nr. Wallace Lake. *Catahoula*: Leland; Hwy 126, 6.8 mi W Hwy 124. *Grant*: Hwy 165, 6 mi N Pollock. *Lincoln*: 5 mi E Ruston. *Morehouse*: Bastrop; Chemin-A-Haut State Park. *Natchitoches*: Hwy 1, 1 mi SE Galbraith; Kisatchie Natl. Forest, Red Bluff Campground. *Ouachita*: Bosco. *St. Tammany*. *Webster*: Shongaloo. MISSISSIPPI: Agricultural College. *Hancock*: I-10 at Hwy 607. *Lowndes*: Columbus. MISSOURI: *Monroe*: Mark Twain State Park. *New Madrid*: I-55, 5 mi S Hwy 62. *Polk*: 3 mi SE Flemington. *Vernon*: Osage Prairie. OKLAHOMA: *Leflore*: Page. TEXAS: *Brazos*: Minter Spgs. *Shelby*: Tenaha.

Comments. This is the most distinctive species in the genus. It can be separated from all other New World species of *Neottiglossa* by the broadly rounded apex of the head and the distinctly concave surface of the head, which is clothed with numerous inward-curving hairs.



Figs. 7–17. Figs. 7–9. *N. cavifrons*. 7. Head. 8. Habitus. 9. Pygophore, caudal view. Figs. 10–13. *N. sulcifrons*. 10. Head. 11. Habitus. 12. Pygophore, caudal view. 13. Lateral margin of abdominal venter. Figs. 14–17. *N. tumidifrons*. 14. Head. 15. Habitus. 16. Pygophore, caudal view. 17. Lateral margin of abdominal venter.

Neottiglossa sulcifrons Stål, 1872

Figs. 10–13

Neottiglossa (*Melanostoma*) *sulfifrons* Stål, 1872b:18.

Melanostoma sulcifrons: Uhler, 1876:284; Uhler, 1877:402.

Neottiglossa sulcifrons: Uhler, 1886:5; Townsend, 1891:53; Lethierry and Severin, 1893:138; Uhler, 1893:368; Uhler, 1894:228; Heidemann, 1899:217; Van Duzee, 1904:50; Crevecoeur, 1905:232; Torre-Bueno and Brimley, 1907:442; Smith, 1910:135; Zimmer, 1912:230; Torre-Bueno, 1913:58; Stoner, 1915a:355; Stoner, 1916:

306; Stoner, 1917:45; Hart, 1919:186, 187; Hussey, 1921:8–15; Parshley, 1921:13–24; Torre-Bueno, 1925:280; Whittaker, 1926:63; Blatchley, 1926:148, 150; Downes, 1927:3; Downes, 1928:91, fig. 2; Hendrickson, 1930:49–179; Harris, 1937:169–176; Ruckes, 1937:32–36; Brimley, 1938:62; Froeschner, 1941:130, 138–139; Esselbaugh, 1946:678; Esselbaugh, 1948:27–28; DeCoursey and Esselbaugh, 1962:331; DeCoursey and Allen, 1968:146; Hoffman, 1971:42; Furth, 1974:37, 38; McPherson and Mohlenbrock, 1976:153; McPherson, 1978:161; McPherson, 1979:93; McPherson, 1980:6; McPherson, 1982:71, 72.

Neottiglossa (Texas) sulcifrons: Kirkaldy, 1904:280; Kirkaldy, 1909:80; Van Duzee, 1916:6; Van Duzee, 1917:48; Stoner, 1920:93, 94–95; Torre-Bueno, 1939:227; Froeschner, 1988:587.

Diagnosis. Lateral margins of head tapering to narrowly rounded apex (Fig. 10); dorsal surface not distinctly concave, with at most a few outward-curving hairs apically; juga pale basally. Scutellum with medial Y-shaped fuscous band, lateral pale areas near apex more extensive, continuing cephalad to subbasal pale calloused spots, lacking pale medial line (Fig. 11). Ventral surface of head and thoracic pleura black except narrow lateral margin of propleura pale; ostiolar rugae and evaporative surfaces black with black punctures. Boundary between dark abdominal surface and pale lateral margin sharp, distinct (Fig. 13). Legs pale except coxae, trochanters, base of each femur, and several spots on superior surface of each femur fuscous. Posterior margin of pygophore as in Figure 12.

Types. Stål (1872b) described *N. sulcifrons* from at least one male and one female specimen from Texas. The types were not examined, but the original description is adequate to fix this species. The types are conserved in the Swedish Museum of Natural History, Stockholm.

Specimens examined. 109 specimens collected from 6 April to 10 October. **UNITED STATES:** ALABAMA: *Macon*: I-85 at Hwy 81. *Tallapoosa*: Alexander City. **ARIZONA:** *Cochise*: Chiricahua Mtns, Coronado Natl. For., Sunny Flat. *Maricopa*: Scottsdale. *Pima*: Boboquivari Mtns, nr. Kitt Peak; 7 mi SE Continental; Lowell Ranger Stn; Santa Catalina Mtns, Bear Wallow; Santa Catalina Mtns, Sabino Cyn; Santa Catalina Mtns, Sycamore Cyn; Santa Rita Mtns, Parkers Ranch; Santa Rita Mtns, Sonoita; Tucson. **ARKANSAS:** *Hempstead*: Hope. *Sebastian*: Hacket. **IOWA:** *Boone*: Ledges State Park. *Page*: Shenandoah. *Story*: Ames. **KANSAS:** *Riley*: Manhattan. **LOUISIANA:** *E. Feliciana*: Boy Scout Camp Avondale, Hwy 10 E of Clinton. *Grant*: Hwy 165, 6 mi N Pollock. *Morehouse*: Chemin-A-Haut State Park. *Natchitoches*: Kisatchie Natl. Forest, Red Bluff Campground. *Webster*: Shongaloo. **MISSISSIPPI:** *Madison*: I-55, 4 mi N Gluckstadt. *Pike*: Summit. *Yazoo*: I-55, 2 mi S Hwy 432. **MONTANA:** *Petroleum*: 1.5 mi S, 5 mi W Winnett. **NEBRASKA:** *Chase*: 10 mi SW Imperial. *Red Willow*: Indianola. **NEW JERSEY:** *Iona*. *Ocean*: Lakehurst. **NEW YORK:** Pinelawn, Long Island. **TEXAS:** *Bosque*: 5 mi S Iredell. *Brazos*: College Station. **VIRGINIA:** Falls Church. **WYOMING:** *Johnson*: Bighorn Natl. Forest, Tie Hack Campground.

Comments. This species is most closely related to *N. cavifrons* and *N. tumidifrons*. It can be separated from all other New World congeners by the combination of the following characters: dorsal surface of head not concave, lacking silvery hairs; evaporative area black; coxae, trochanters, and base of each femur fuscous.

Neottiglossa tumidifrons Downes, 1928
Figs. 14–17

Neottiglossa cavifrons (of authors, not Stål): Van Duzee, 1904:49, 50; Stoner, 1926: 29; Blatchley, 1934:4.

Neottiglossa (Texas) cavifrons (of authors, not Stål): Kirkaldy, 1909:80 (part); Van Duzee, 1916:6; Van Duzee, 1917:48 (part); Torre-Bueno, 1939:227 (part).

Neottiglossa tumidifrons Downes, 1928:90–92, fig. 3; Downes, 1935:46.

Neottiglossa (Texas) tumidifrons: Froeschner, 1988:587.

Diagnosis. Lateral margins of head tapering to narrowly rounded apex (Fig. 14); dorsal surface concave, lacking silver hairs; juga mostly pale yellow, distinctly tumescent. Scutellum mostly pale except one apical and two basal infuscated areas, with distinct medial pale line from base to apical dark area (Fig. 15). Ventral surface of head and thoracic pleura black except lateral margin of propleura and sometimes area around coxal cavities pale; ostiolar rugae sometimes pale; evaporative areas black with black punctures. Boundary between dark abdominal surface and pale lateral areas not distinct, diffuse (Fig. 17). Femora with a few obscure fuscous spots; coxae fuscous, trochanters and base of each femur pale. Posterior margin of pygophore as in Figure 16.

Types. Downes (1928) described *N. tumidifrons* from 22 specimens with the holotype from the Saanich District, British Columbia, Canada. The holotype is conserved in the Canadian National Collection, Ottawa.

Specimens examined. 127 specimens collected from 5 March to 8 October. CANADA: BRITISH COLUMBIA: Bear Hill; Summerland; Victoria. UNITED STATES: CALIFORNIA: Blue Cyn. *Fresno*: Friant. *Humboldt*: Eureka; Miranda mp 6.52, Avenue of the Giants. *Lake*: 0.2 mi W intersection of rts. 20 & 53. *Los Angeles*: Griffith's Park. *Mariposa*: Mormon Bar; Yosemite. *Mendocino*: 15 mi E Fort Bragg. *Napa*: N side Howell Mtn, 2 mi NNE Angwin. *Riverside*: Hwy 243, 2 mi N Poppet Flat. *San Diego*: Pauma. *San Mateo*. *Santa Barbara*: Santa Barbara. *Shasta*: Hat Crk; 25 mi SE McCloud. *Siskiyou*: Macdoel; 6 mi S Macdoel; Weed. *Sonoma*. *Tulare*: Visalia. IDAHO: Lenore. *Cassia*: 3.5 mi SE Basin. *Latah*: Kendrick; Moscow. *Owyhee*: Hot Spring. *Twin Falls*: 9 mi SW Rogerson; Shoshone Falls. OREGON: *Benton*: Corvallis. *Jackson*: 2 mi S Ashland; Dead Indian Sprg; Griffin Crk; Prospect; 3 mi S Prospect; Shady Grove. *Josephine*: Cave Jnct; 7 mi W Grants Pass; Illinois R; 9 mi S Selma. *Klamath*: above Algoma; Buck Lake Road, 2.5 mi N Hwy 66; 12 mi SW Keno; Meryl Crk, 7 mi NW Bly; Modoc Point; 3 mi S Saddle Mtn. *Lane*: Eugene. *Linn*: Lacomb. *Wallowa*: Copper Crk at Snake R. *Wasco*: 12 mi S Dufur. *Washington*: Dilley. UTAH: *Cache*: Hyde Park; Providence. *Salt Lake*: Salt Lake City. *Utah*: Hobble Crk Cyn, 5 mi E Springfield. WASHINGTON: *Pierce*: Parkland. *Thurston*: Olympia. *Whitman*: Pullman. *Yakima*: Satus Crk; Tieton; Yakima.

Comments. This species is most closely related to *N. cavifrons* and *N. sulcifrons*. It can be separated from all North American congeners by the following combination of characters: slightly concave dorsal surface of the head lacking short silvery hairs; evaporative area black; coxae black; and boundary between dark abdominal surface and pale lateral margin diffuse, indistinct.

ACKNOWLEDGMENTS

I am indebted to the following individuals for the loan of specimens and other assistance relevant to this study: P. H. Arnaud, Jr. (California Academy of Sciences, San Francisco); J. B. Chapin (Louisiana State University); R. Danielsson (Lund University, Lund, Sweden); J. E. Eger (personal collection, Tampa, FL); T. J. Henry (National Museum of Natural History, Washington, D.C.); M. A. Ivie (Montana State University, Bozeman); J. Loye (University of Utah, Salt Lake City); L. H. Rolston (personal collection, Baton Rouge, LA); and R. T. Schuh and M. D. Schwartz (American Museum of Natural History, NY). Special thanks go to P. H. Arnaud, Jr. and T. J. Henry for arranging the loans of the types of *N. californica* and *N. coronaciliata*, respectively.

I would also like to thank J. B. Chapin, J. A. Moore, and L. H. Rolston (Louisiana State University, Baton Rouge) for their critical review of the manuscript.

Approved for publication by the Director of the Louisiana Agricultural Experiment Station as manuscript number 89-17-3231.

LITERATURE CITED

- Blatchley, W. S. 1926. Heteroptera or True Bugs of Eastern North America with Especial Reference to the Faunas of Indiana and Florida. Nature Pub. Co., Indianapolis, 1,116 pp.
- Blatchley, W. S. 1934. Notes on a collection of Heteroptera taken in winter in the vicinity of Los Angeles, California. Trans. Amer. Entomol. Soc. 60:1-16.
- Bliven, B. P. 1958. Studies on insects of the Redwood Empire II: New Hemiptera and further notes on the Colladonus complex. The Occidental Entomol. 1(2):8-24.
- Brimley, C. S. 1938. The Insects of North Carolina Being a List of the Insects of North Carolina and Their Close Relatives. North Carolina Dept. Agr., Div. Entomol. (Raleigh), 560 pp.
- Crevecoeur, F. F. 1905. Additions to the list of the hemipterous fauna of Kansas. Trans. Kansas Acad. Sci. 19:232-237.
- Dallas, W. S. 1851. List of the specimens of hemipterous insects in the collection of the British Museum. London. Part 1:1-368.
- DeCoursey, R. M. and R. C. Allen. 1968. A generic key to the nymphs of the Pentatomidae of the eastern United States (Hemiptera: Heteroptera). Univ. Connecticut Occas. Papers Biol. Sci. Ser. 1(3):141-151.
- DeCoursey, R. M. and C. O. Esselbaugh. 1962. Descriptions of the nymphal stages of some North American Pentatomidae (Hemiptera-Heteroptera). Ann. Entomol. Soc. Amer. 55(3):323-342.
- Dohrn, F. A. 1859. Catalogus Hemipterorum. Herrcke and Lebeling, Stettin, 112 pp.
- Downes, W. 1927. A preliminary list of the Heteroptera and Homoptera of British Columbia. Proc. Entomol. Soc. British Columbia 23:1-22.
- Downes, W. 1928. A new species of *Neottiglossa* (Pentatomidae, Hemiptera). Can. Entomol. 60:90-92.
- Downes, W. 1935. Additions to the list of B.C. Hemiptera. Proc. Entomol. Soc. Brit. Columbia 31:46-48.
- Esselbaugh, C. O. 1946. A study of the eggs of the Pentatomidae (Hemiptera). Ann. Entomol. Soc. Amer. 39(4):667-691.
- Esselbaugh, C. O. 1948. Notes on the bionomics of some midwestern Pentatomidae. Entomol. Amer. 28(1):1-73.
- Fieber, F. X. 1860 (1861). Die europäischen Hemiptera. Halbflügler (Rhynchota Heteroptera). Nach der Analytischen Methode bearbeitet. Wien. 1860:1-112, 1861, 3-6:113-444.
- Froeschner, R. C. 1941. Contributions to a synopsis of the Hemiptera of Missouri, Pt. 1.

- Scutelleridae, Podopidae, Pentatomidae, Cydnidae, Thyreocoridae. Amer. Midland Natur. 26(1):122-146.
- Froeschner, R. C. 1988. Family Pentatomidae Leach, 1815. The Stink Bugs. In: T. J. Henry and R. C. Froeschner (eds.), Catalog of the Heteroptera, or True Bugs of Canada and the Continental United States. E. J. Brill, Leiden, New York, København, Köln, 958 pp.
- Furth, D. G. 1974. The stink bugs of Ohio (Hemiptera: Pentatomidae). Bull. Ohio Biol. Surv. (N.S.) 5(1):1-60.
- Harris, H. M. 1937. Contributions to the South Dakota list of Hemiptera. Iowa State Coll. J. Sci. 11(2):169-176.
- Hart, C. A. 1919. The Pentatomoidea of Illinois with keys to the Nearctic genera. Illinois Natur. Hist. Surv. Bull. 13(7):157-223.
- Heidemann, O. 1899. Heteroptera found on ox-eye daisy (*Chrysanthemum leucanthemum*). Proc. Entomol. Soc. Wash. 4(3):217.
- Hendrickson, G. O. 1930. Studies on the insect fauna of Iowa prairies. Iowa State Coll. J. Sci. 4:49-179.
- Hoffman, R. L. 1971. The insects of Virginia: No. 4. Shield bugs (Hemiptera: Scutelleroidea: Scutelleridae, Corimelaenidae, Cydnidae, Pentatomidae). Virginia Polytechnic Inst. and State Univ. Res. Div. Bull. 67:1-61.
- Hussey, R. F. 1921. Distributional notes on Hemiptera, with the description of a new *Gerris*. Psyche 28:8-15.
- Hussey, R. F. 1922. Notes on *Neottiglossa trilineata* Kirby (Hemiptera, Pentatomidae). Psyche 29(2):85-88.
- Jakovlev, B. E. 1903. Hemipteres-Heteropters nouveaux de la faune palearctique VII. Rev. Russ. Entomol. 3:289-293, 377-380.
- Kirby, W. 1837. P. 276. In: J. Richardson (ed.), Fauna Boreali-Americana; or the Zoology of the Northern Parts of British America. Norwich. Vol. 4:1-325 + XXXIX.
- Kirkaldy, G. W. 1904. Bibliographical and nomenclatural notes on the Hemiptera.—No. 3. Entomologist 37:254-258, 279-283.
- Kirkaldy, G. W. 1909. Catalogue of the Hemiptera (Heteroptera) with biological and anatomical references, lists of foodplants and parasites, etc. Vol. I: Cimicidae. Berlin. 392 + XL pp.
- Lethierry, L. F. and G. Severin. 1893. Catalogue Général des Hémiptères, Vol. 1, Pentatomidae. Brussels and Berlin. i-x + 286 pp.
- MacGillivray, A. D. and C. O. Houghton. 1903. A list of insects taken in the Adirondack Mountains, N.Y.—III. Entomol. News 14:262-265.
- McPherson, J. E. 1970. A key and annotated list of the Scutelleroidea of Michigan (Hemiptera). Great Lakes Entomol. 3(2):34-63.
- McPherson, J. E. 1978. A list of the Scutelleroidea (Hemiptera) of southern Illinois. Great Lakes Entomol. 11(3):159-162.
- McPherson, J. E. 1979. A revised list of the Pentatomoidea of Illinois (Hemiptera). Great Lakes Entomol. 12(3):91-98.
- McPherson, J. E. 1980. The distribution of the Pentatomoidea in the northeastern quarter of the United States. Great Lakes Entomol. 13(1):1-16.
- McPherson, J. E. 1982. The Pentatomoidea (Hemiptera) of Northeastern North America with Emphasis on the Fauna of Illinois. Southern Illinois Univ. Press, Carbondale and Edwardsville, 241 pp.
- McPherson, J. E. and R. H. Mohlenbrock. 1976. A list of the Scutelleroidea of the La Rue-Pine Hills Ecological Area with notes on biology. Great Lakes Entomol. 9(3):125-169.
- Mulsant, E. and C. Rey. 1866. Histoire naturelle des punaises de France. Pentatomides 2:1-372, 2 pls.
- Oetting, R. D. and T. R. Yonke. 1971. Biology of some Missouri stink bugs. J. Kans. Entomol. Soc. 44(4):446-459.

- Olsen, C. E. 1912. Contribution to an annotated list of Long Island insects. *J. New York Entomol. Soc.* 20:48-58.
- Osborn, H. 1892. Catalogue of the Hemiptera of Iowa. *Proc. Iowa Acad. Sci.* 1 (part 2):120-131.
- Parshley, H. M. 1914. List of the Hemiptera-Heteroptera of Maine. *Psyche* 21(5):139-149.
- Parshley, H. M. 1915. Systematic papers on New England Hemiptera. II. Synopsis of the Pentatomidae. *Psyche* 22(5):170-177.
- Parshley, H. M. 1917. Fauna of New England. 14. List of the Hemiptera-Heteroptera. *Occ. Papers Boston Soc. Natur. Hist.* 7:1-125.
- Parshley, H. M. 1921. A report on some Hemiptera from British Columbia. *Proc. Entomol. Soc. Brit. Columbia* 18:13-24.
- Parshley, H. M. 1923. Families Pentatomidae, Cydnidae, Scutelleridae. *In*: W. E. Britton (ed.), *Guide to the insects of Connecticut. Part IV. The Hemiptera or sucking insects of Connecticut.* *Connecticut State Geol. Natur. Hist. Surv. Bull.* 34:1-807.
- Provancher, A. L. 1885. Petite Faune Entomologique du Canada et Particulièrement de la Province de Quebec. Vol. 3. Cinquieme Ordre les Hemipteres. *Naturaliste Canadien* 12: 1-64.
- Rolston, L. H. and F. J. D. McDonald. 1984. A conspectus of Pentatomini of the western hemisphere. Part 3 (Hemiptera: Pentatomidae). *J. New York Entomol. Soc.* 92(1):69-86.
- Ruckes, H. 1937. An annotated list of some pentatomids (Heteroptera) from New Mexico. *Bull. Brooklyn Entomol. Soc.* 32(1):32-36.
- Ruckes, H. 1957. New species of Pentatomidae from North and South America (Heteroptera) II. *Bull. Brooklyn Entomol. Soc.* 52(2):39-47.
- Say, T. 1832. Descriptions of new species of heteropterous Hemiptera of North America. *New Harmony, Indiana*, 39 pp.
- Say, T. 1859. The complete writings of Thomas Say on the entomology of North America, with a memoir of the author, by George Ord. Edited by John L. Le Conte, M.D. *New York. Vol. 1:XXIV + 412 pp. + 54 pls; Vol. 2:IV + 814 pp.* (Reprinted in Philadelphia in 1891.)
- Scott, W. M. and W. F. Fiske. 1902. Jarring for the curculio on an extensive scale in Georgia, with a list of the insects caught. *USDA Div. Entomol. Bull. (N.S.)* 31:24-36.
- Smith, J. B. 1910. A report on the insects of New Jersey. *Report of the New Jersey State Museum, 1909*, 888 pp.
- Stål, C. 1872a. Genera Pentatomidarum Europae disposuit. *Öfver. Kongliga Vetenskaps-Akad. Förhandlingar* 29(3):31-40.
- Stål, C. 1872b. Enumeratio Hemipterorum. *Bidrag till en forteckning ofver alla hittills kända Hemiptera, jemte systematiska meddelanden. 2. Kongliga Svenska Vetenskaps-Akad. Handlingar* 10(4):1-159.
- Stoner, D. 1915a. Preliminary notes on Iowa Pentatomoidea (Heterop.). *Entomol. News* 26(10):353-355.
- Stoner, D. 1915b. Notes on Iowa Pentatomoidea. *Proc. Iowa Acad. Sci.* 22:347-354.
- Stoner, D. 1916. Distributional notes on some Iowa Pentatomoidea. *Proc. Iowa Acad. Sci.* 23:303-307.
- Stoner, D. 1917. The Pentatomoidea of the Lake Okoboji region. *Bull. Lab. Natur. Hist., Univ. Iowa* 7(3):39-47.
- Stoner, D. 1920. The Scutelleroidea of Iowa. *Univ. Iowa Stud. Natur. Hist.* 8:1-140.
- Stoner, D. 1925. The Scutelleroidea of the Douglas Lake region. *Iowa Studies Natur. Hist.* 10(1):45-65.
- Stoner, D. 1926. Pentatomoidea from western Canada. *Can. Entomol.* 58(2):28-30.
- Summers, H. E. 1898. A generic synopsis of the Nearctic Pentatomidae. *Proc. Iowa Acad. Sci.* 6:40-46.

- Torre-Bueno, J. R. de la. 1913. Some heteropterous Hemiptera from Southern Pines, N.C. *Can. Entomol.* 45:57-60.
- Torre-Bueno, J. R. de la. 1918. Some Heteroptera from the Parry Sound District, Ont. *Can. Entomol.* 50:24-25.
- Torre-Bueno, J. R. de la. 1925. On a small collection of Heteroptera from British Columbia. *Can. Entomol.* 57:280-286.
- Torre-Bueno, J. R. de la. 1939. A synopsis of the Hemiptera-Heteroptera of America north of Mexico. Part I. Families Scutelleridae, Cydnidae, Pentatomidae, Aradidae, Dysodiidae and Temitaphididae. *Entomol. Amer.* 19(3):141-304.
- Torre-Bueno, J. R. de la and C. S. Brimley. 1907. On some heteropterous Hemiptera from N. Carolina. *Entomol. News* 18:433-443.
- Townsend, C. H. T. 1891. Hemiptera collected in southern Michigan. *Proc. Entomol. Soc. Wash.* 2:52-56.
- Uhler, P. R. 1871. Notices of some Heteroptera in the collection of Dr. T. W. Harris. *Proc. Boston Soc. Natur. Hist.* 14:93-109.
- Uhler, P. R. 1872a. Notices of the Hemiptera of the western territories of the United States, chiefly from the surveys of Dr. F. V. Hayden. Pages 392-423 *in*: F. V. Hayden. *Prelim. Rep. U.S. Geol. Surv. Montana and Portions Adjacent Territories*, 5th Annu. Rep. Govt. Printing Office.
- Uhler, P. R. 1872b. A list of Hemiptera collected in eastern Colorado and northeastern New Mexico, by C. Thomas, during the expedition of 1869. *Geol. Surv. Terr.*:471-472.
- Uhler, P. R. 1876. List of Hemiptera of the region west of the Mississippi River, including those collected during the Hayden Explorations of 1873. *Bull. U.S. Geol. Geogr. Surv. Territories* 2(5):269-361, pls 19-21.
- Uhler, P. R. 1877. Report upon the insects collected by P. R. Uhler during the explorations of 1875, including monographs of the families Cydnidae and Saldae [sic], and the Hemiptera collected by A. S. Packard, Jr., M.D. *Bull. U.S. Geol. Geogr. Surv. Territories* 3(2):355-475, 765-801.
- Uhler, P. R. 1878. Notices of the Hemiptera Heteroptera in the collection of the late T. W. Harris, M.D. *Proc. Boston Soc. Natur. Hist.* 19:365-446.
- Uhler, P. R. 1886. Check-list of the Hemiptera Heteroptera of North America. *Brooklyn Entomol. Soc.*, Brooklyn, 32 pp.
- Uhler, P. R. 1893. Summary of the collection of Hemiptera secured by Mr. E. A. Schwarz in Utah. *Proc. Entomol. Soc. Wash.* 2:366-385.
- Uhler, P. R. 1894. Observations upon the heteropterous Hemiptera of Lower California, with description of new species. *Proc. California Acad. Sci. (2nd Series)* 4:223-295.
- Van Duzee, E. P. 1889. Hemiptera from Muskoka Lake District. *Can. Entomol.* 21(1):1-11.
- Van Duzee, E. P. 1894. A list of the Hemiptera of Buffalo and vicinity. *Bull. Buffalo Soc. Natur. Sci.* 5(4):167-204.
- Van Duzee, E. P. 1904. Annotated list of the Pentatomidae recorded from America north of Mexico, with descriptions of some new species. *Trans. Amer. Entomol. Soc.* 30(1):1-80.
- Van Duzee, E. P. 1905. List of Hemiptera taken in the Adirondack Mountains. *New York State Mus. Bull.* 97:546-556.
- Van Duzee, E. P. 1912. Synonymy of the Provancher collection of Hemiptera. *Can. Entomol.* 44(11):317-329.
- Van Duzee, E. P. 1916. Check list of the Hemiptera (excepting the Aphididae, Aleurodidae and Coccidae) of America, north of Mexico. *New York Entomol. Soc.*, New York, 111 pp.
- Van Duzee, E. P. 1917. Catalogue of the Hemiptera of America north of Mexico excepting the Aphididae, Coccidae and Aleurodidae. *Univ. California Pub., Tech. Bull., Entomol.* 2:1-902.

- Whittaker, O. 1926. Records of Hemiptera from British Columbia. *Can. Entomol.* 58:63.
- Wirtner, P. M. 1904. A preliminary list of the Hemiptera of western Pennsylvania. *Ann. Carnegie Mus.* 3:183-232.
- Zimmer, J. T. 1912. The Pentatomidae of Nebraska. *Univ. Nebraska Contrib. Dep. Entomol.* 11(3):219-251 (1911).

Received May 24, 1989; accepted September 13, 1989.